

New Maintenance-free Bearings From Federal-Mogul Powertrain's DEVA Brand Provide Environmental, Cost And Durability Benefits

Self-lubricating bearings validated for special-purpose vehicles

Stadtallendorf, Germany, October 17, 2017... Federal-Mogul Powertrain has successfully validated its DEVA[®] maintenance-free sliding bearings for special-purpose vehicle chassis applications. Following in-house tribological testing and customer-specific field investigations, deva.tex[®] composite bearings are being commercialized for use in construction machines, agricultural vehicles and other special-purpose vehicles, such as road sweepers. The fiber-reinforced bearings are able to reduce the environmental impact, downtime and maintenance costs associated with traditional grease-lubricated bearings.

“deva.tex self-lubricating, maintenance-free sliding bearings can provide a tangible solution for manufacturers seeking to meet strict new environmental legislation,” said Gian Maria Olivetti, Chief Technology Officer, Federal-Mogul Powertrain. “We overcome the inherent risk of leakage suffered by grease-lubricated bearings by offering a cleaner solution that is also more cost-effective for the operator.”

Federal-Mogul Powertrain has carried extensive rig trials to optimize friction and wear properties under specific operating conditions as part of the validation process. deva.tex two-layer fiber-reinforced composite bearings have been run against various shaft materials as well as under varying load, sliding speed and oscillating cycle conditions.

deva.tex technology benefits

A significant advantage of DEVA composite materials is the ability to reduce wear and eliminate the premature failures that can occur in metal bearings when subjected to shaft misalignment. This is made possible by the materials' heightened tolerance of shaft offset or misalignment: unlike metal bushes, the softer DEVA materials conform better to the shaft geometry, spreading the contact over a larger area and increasing the load capacity.

“Different special-purpose vehicles operate in such distinct and often challenging environments, and so it is unrealistic for a single off-the-shelf design to satisfy all applications,” explained Stefan Henß, Senior Engineering Manager DEVA, Federal-Mogul Powertrain. “Any successful implementation requires collaboration with the customer to ensure the bearing forms part of an integrated tribological system. We work closely with each customer to ensure that the bearing installation includes, for example, appropriate sealing to exclude any abrasive or corrosive contaminants from the surrounding environment. This is a key factor in ensuring long life and reliable operation.”

Extensive validation process

Tests highlighted the importance of specifying the appropriate surface properties for the shaft, to maintain a stable and robust tribological system. The hardness needs to be above 220 HB Brinell when used with deva.tex, and surface roughness between 0.4 and 1.0 $\mu\text{m Ra}$. Suitable corrosion resistance is also required, for example by using stainless steel or an appropriate coating. This enables the bearing to transfer a stable film onto the shaft surface, maintaining a constant coefficient of friction and the lowest possible wear rate.

Having validated bearing performance, the future research priority for Federal-Mogul Powertrain will be to investigate the potential of economical shaft coatings. These will be evaluated for corrosion resistance, wear

performance and sliding properties to establish the optimum for use with DEVA bearings.

“Increasing environmental awareness and stricter legal regulations are leading to a growing demand for environmentally friendly solutions,” said Henß. “Add to that the attraction of low-maintenance or maintenance-free systems and we expect to see a rapidly increasing market for our self-lubricating solutions.”

About Federal-Mogul

Federal-Mogul LLC is a leading global supplier of products and services to the world’s manufacturers and servicers of vehicles and equipment in the automotive, light, medium and heavy-duty commercial, marine, rail, aerospace, power generation and industrial markets. The company’s products and services enable improved fuel economy, reduced emissions and enhanced vehicle safety.

Federal-Mogul operates two independent business divisions, each with a chief executive officer reporting to Federal-Mogul's Board of Directors.

Federal-Mogul Powertrain designs and manufactures original equipment powertrain components and systems protection products for automotive, heavy-duty, industrial and transport applications.

Federal-Mogul Motorparts sells and distributes a broad portfolio of products through more than 20 of the world’s most recognized brands in the global vehicle aftermarket, while also serving original equipment vehicle manufacturers with products including braking, wipers and a range of chassis components. The company’s aftermarket brands include ANCO[®] wipers; Beck/Arnley[®] premium OE quality parts and fluids; BERU[®]* ignition systems; Champion[®] lighting, spark plugs, wipers and filters; Interfil[®] filters; AE[®], Fel-Pro[®], FP Diesel[®], Goetze[®], Glyco[®], National[®], Nüral[®], Payen[®], Sealed Power[®] and Speed-Pro[®] engine products; MOOG[®] chassis components; and Abex[®], Ferodo[®], Jurid[®] and Wagner[®] brake products and lighting.

Federal-Mogul was founded in Detroit in 1899 and maintains its worldwide headquarters in Southfield, Michigan. The Company has nearly 53,000 employees in 24 countries. For more information, please visit www.federalmogul.com.

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